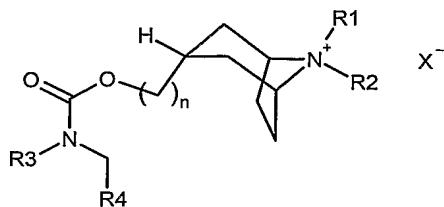


What is claimed is:

1. A compound according to Formula (I) represented by the structure:

5



(I)

wherein:

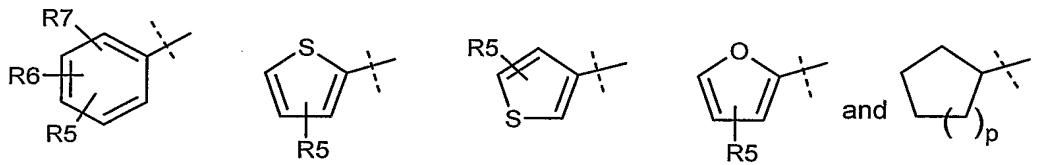
R1 is a bond, hydrogen or C1-4 alkyl;

10

R2 is selected from the group consisting of hydrogen, C1-10 alkyl, halosubstituted C1-10 alkyl, C1-10 alkyl cyano, C2-10 alkenyl, cycloalkyl, C1-10 alkylcycloalkyl, cycloalkyl C1-10 alkyl, and (CR8R8)q-ORA;

15

R3 and R4 are independently selected from the group consisting of



wherein, R5, R6 and R7 are, independently, selected from the group consisting of hydrogen, halogen, C1-4 alkyl, C2-5 alkenyl, C1-4 alkoxy, halosubstituted C1-4

20 alkoxyl, halosubstituted C1-4 alkyl, hydroxy, and cyano;

n is an integer having a value of 0 to 2;

p is an integer having a value of 0 to 3;

q is an integer having a value of 2 to 10;

25

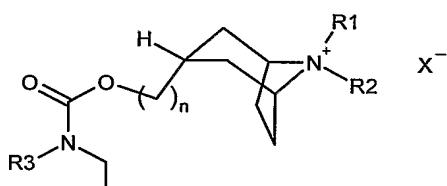
Ra is selected from the group consisting of hydrogen, C1-10 alkyl, aryl, aryl C1-10 alkyl, C1-4 alkyl aryl, halosubstituted C1-10 alkyl, C1-10 alkoxy, halosubstituted C1-10 alkoxy, C1-10 alkyl cyano and C2-10 alkenyl;

5 R8 is hydrogen, halogen or C1-4 alkyl; and

X<sup>-</sup> is a physiologically acceptable anion.

2. A compound according to claim 1 of formula (I) herein below:

10



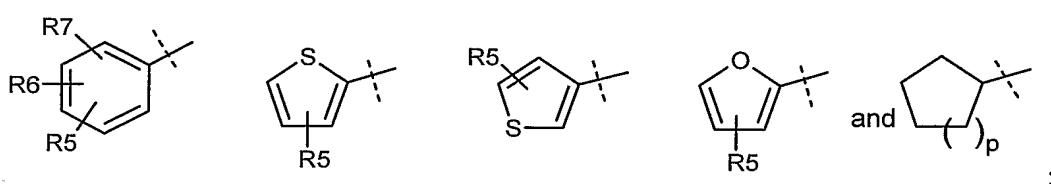
(I)

wherein:

15 R1 is a bond, hydrogen or C1-4 alkyl

R2 is selected from the group consisting of hydrogen, C1-4 alkyl, C2-5 alkenyl, C1-4 alkylcycloalkyl, and (CR8R8)q-ORA;

20 R3 and R4 are independently selected from the group consisting of



wherein R5, R6 and R7, are independently, selected from the group consisting of

25 hydrogen, halogen, C1-4 alkyl, C2-5 alkenyl, C1-4 alkoxy, and cyano;

n is an integer having a value of 0 or 1;

p is an integer having a value of 1 or 2;  
q is an integer having a value of 2 to 4;

Ra is selected from the group consisting of hydrogen, C1-4 alkyl, aryl, aryl C1-4 alkyl,  
5 C1-4 alkyl aryl, and C1-10 alkyl;

R8 is hydrogen; and

X- is selected from the group consisting of chloride, bromide, iodide, hydroxide,  
10 sulfate, nitrate, phosphate, acetate, trifluoroacetate, fumarate, citrate, tartrate, oxalate,  
succinate, mandelate, methanesulfonate and p-toluenesulfonate.

3. A compound according to claim 1 selected from the group of :

15 (3-*endo*)-8,8-dimethyl-3-({{[3-thienyl(3-thienylmethyl)amino]carbonyl}oxy}-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({{[(phenylmethyl)(3-thienyl)amino]carbonyl}oxy}-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-3-({{[(3-fluorophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-  
20 8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({{[phenyl(2-thienylmethyl)amino]carbonyl}oxy}-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-3-({{[(4-fluorophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-  
8-azoniabicyclo[3.2.1]octane bromide;  
25 (3-*endo*)-8,8-dimethyl-3-({{[phenyl(3-thienylmethyl)amino]carbonyl}oxy}-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({{[(phenylmethyl)(2-thienyl)amino]carbonyl}oxy}-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-3-({{[(4-fluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-  
30 8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-3-({{[(2-fluorophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-  
8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{[(3-fluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{[(3-fluorophenyl)methyl](phenyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

5 (3-*endo*)-3-({{[(2-fluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8,8-dimethyl-3-({[phenyl(phenylmethyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{[(2,4-difluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-

10 dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8,8-dimethyl-3-({[2-thienyl(3-thienylmethyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane iodide;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-yl 2-thienyl(3-thienylmethyl)carbamate trifluoroacetate;

15 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-yl 3-thienyl(3-thienylmethyl)carbamate trifluoroacetate;

(3-*endo*)-8,8-dimethyl-3-({{[(5-methyl-2-thienyl)methyl](phenyl)amino]carbonyl}oxy}-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl (phenylmethyl)2-thienylcarbamate;

20 (3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl 3-thienyl(3-thienylmethyl)carbamate;

(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl [(4-fluorophenyl)methyl]3-thienylcarbamate;

(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl (phenylmethyl)3-thienylcarbamate;

(3-*endo*)-3-({[(cyclohexylmethyl)(3-thienyl)amino]carbonyl}oxy)-8,8-dimethyl-8-

25 azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(4-fluorophenyl)methyl]2-thienylcarbamate;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(3,4-difluorophenyl)methyl]2-thienylcarbamate;

30 (3-*endo*)-8-(6-hydroxyhexyl)-8-methyl-3-({[3-thienyl(3-thienylmethyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(2-fluorophenyl)methyl]3-thienylcarbamate;

(3-*endo*)-3-({[(2-fluorophenyl)methyl](phenyl)amino]carbonyl}oxy)-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

5 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(3-fluorophenyl)methyl]2-thienylcarbamate;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(3-fluorophenyl)methyl]3-thienylcarbamate;

10 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(3,5-difluorophenyl)methyl]3-thienylcarbamate;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl 3-thienyl[(2,4,5-trifluorophenyl)methyl]carbamate;

(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl [(3-fluorophenyl)methyl]3-thienylcarbamate;

15 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(2-fluorophenyl)methyl]2-thienylcarbamate;

(3-*endo*)-3-({[(3-furanylmethyl)(phenyl)amino]carbonyl}oxy)-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(2,4-difluorophenyl)methyl]2-thienylcarbamate;

20 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(2,3-difluorophenyl)methyl]3-thienylcarbamate;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl [(2,5-difluorophenyl)methyl]2-thienylcarbamate;

25 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl phenyl(phenylmethyl)carbamate;

(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl phenyl(2-thienylmethyl)carbamate;

(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl [(2-fluorophenyl)methyl]3-thienylcarbamate;

(3-*endo*)-8,8-dimethyl-3-({[(3-methyl-2-

30 thienyl)methyl](phenyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-ylmethyl 2-thienyl[(2,3,4-trifluorophenyl)methyl]carbamate;

(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl (phenylmethyl)2-thienylcarbamate;  
(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl [(3-fluorophenyl)methyl]2-thienylcarbamate;  
(3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl phenyl(3-thienylmethyl)carbamate;

5 (3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl [(4-fluorophenyl)methyl]2-thienylcarbamate;  
(3-*endo*)-8-(6-hydroxyhexyl)-8-azabicyclo[3.2.1]oct-3-yl 3-thienyl(3-thienylmethyl)carbamate;

10 (3-*endo*)-8-methyl-8-azabicyclo[3.2.1]oct-3-yl [(2-fluorophenyl)methyl]2-thienylcarbamate;  
(3-*endo*)-3-({{[(4-bromophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide; and  
(3-*endo*)-8,8-dimethyl-3-({[(5-methyl-2-furanyl)methyl](phenyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide.

15 4. A compound according to claim 3 selected from the group consisting of:  
(3-*endo*)-8,8-dimethyl-3-({[3-thienyl(3-thienylmethyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({[(phenylmethyl)(3-thienyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;

20 (3-*endo*)-3-({{[(3-fluorophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({[phenyl(2-thienylmethyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-3-({{[(4-fluorophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-

25 8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({[phenyl(3-thienylmethyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;  
(3-*endo*)-8,8-dimethyl-3-({[(phenylmethyl)(2-thienyl)amino]carbonyl}oxy)-8-azoniabicyclo[3.2.1]octane bromide;

30 (3-*endo*)-3-({{[(4-fluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{{[(2-fluorophenyl)methyl](3-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{{[(3-fluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

5 (3-*endo*)-3-({{{[(3-fluorophenyl)methyl](phenyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{{[(2-fluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8,8-dimethyl-3-( {[phenyl(phenylmethyl)amino]carbonyl}oxy)-8-

10 azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-3-({{{[(2,4-difluorophenyl)methyl](2-thienyl)amino]carbonyl}oxy}-8,8-dimethyl-8-azoniabicyclo[3.2.1]octane bromide;

(3-*endo*)-8,8-dimethyl-3-( {[2-thienyl(3-thienylmethyl)amino]carbonyl}oxy)-8-

azoniabicyclo[3.2.1]octane iodide;

15 (3-*endo*)-8-azabicyclo[3.2.1]oct-3-yl 2-thienyl(3-thienylmethyl)carbamate trifluoroacetate; and

(3-*endo*)-8-azabicyclo[3.2.1]oct-3-yl 3-thienyl(3-thienylmethyl)carbamate trifluoroacetate.

20 5. A pharmaceutical composition for the treatment of muscarinic acetylcholine receptor mediated diseases comprising a compound according to claim 1 and a pharmaceutically acceptable carrier thereof.

6. A method of inhibiting the binding of acetylcholine to its receptors in a

25 mammal in need thereof comprising administering a safe and effective amount of a compound according to claim 1.

7. A method of treating a muscarinic acetylcholine receptor mediated disease, wherein acetylcholine binds to said receptor, comprising administering a safe and

30 effective amount of a compound according to claim 1.

8. A method according to claim 7 wherein the disease is selected from the group consisting of chronic obstructive lung disease, chronic bronchitis, asthma, chronic respiratory obstruction, pulmonary fibrosis, pulmonary emphysema and allergic rhinitis.

5

9. A method according to claim 7 wherein administration is via inhalation via the mouth or nose.

10. A method according to claim 7 wherein administration is via a medicament 10 dispenser selected from a reservoir dry powder inhaler, a multi-dose dry powder inhaler or a metered dose inhaler.